

WHAT IS CLAIMED IS:

1 1. First in first out hydration tank with a stationary outside tank wall, a
2 stationary central inlet tube provided centrally within said outside tank wall, a
3 vessel wall provided between said central inlet tube and said outside tank wall so
4 that liquid flows in a downward direction within said inlet tube and then in an
5 upward direction between said inlet tube and said vessel wall and then again in a
6 downward direction between the vessel wall and the outside tank wall before
7 exiting through an exit provided at the bottom of the outside tank wall wherein the
8 improvement comprises:

9 means for mixing a liquid in a direction that is normal to a direction of flow
10 of the liquid as the liquid passes between an inlet and an exit of a first in first out
11 hydration tank.

1 2. A hydration tank according to Claim 1 wherein the means for mixing
2 a liquid in a direction that is normal to a direction of flow of the liquid as the liquid
3 passes between an inlet and an exit of a first in first out hydration tank further
4 comprises:

5 horizontally extending vanes provided on a vessel wall that is located
6 between an outside tank wall and a central inlet tube, and said vessel wall
7 rotating relative to the outside tank wall and the central inlet tube.

1 3. A hydration tank according to Claim 1 wherein the means for mixing
2 a liquid in a direction that is normal to a direction of flow of the liquid as the liquid
3 passes between an inlet and an exit of a first in first out hydration tank further
4 comprises:

5 horizontally extending vanes provided on the outside tank wall and the
6 central inlet tube that interleaf in spaced apart relationship with the vanes
7 provided on the rotating vessel wall.

1 4. A first in first out hydration tank comprising:

2 a stationary outside tank wall, said tank wall provided with an exit provided
3 at a bottom of the tank wall,

4 a stationary central inlet tube provided centrally within said outside tank
5 wall with an inlet provided at a top of the inlet tube,

6 a vessel wall provided between said central inlet tube and said outside
7 tank wall so that liquid flows from the inlet in a downward direction within said
8 inlet tube and then in an upward direction between said inlet tube and said vessel

9 wall and then again in a downward direction between the vessel wall and the
10 outside tank wall before exiting through the exit, and

11 said vessel wall rotating in a direction that is normal to the direction of
12 liquid flow on either side of the vessel wall.

1 5. A first in first out hydration tank according to Claim 4 further
2 comprising:

3 vanes secured to and extending approximately horizontally from said
4 rotating vessel wall.

1 6. A first in first out hydration tank according to Claim 5 further
2 comprising:

3 stationary vanes secured to and extending approximately horizontally from
4 said inlet tube and said outside tank wall so that the stationary vanes interleaf
5 and are spaced apart from the vanes provided on said vessel wall.

1 7. A first in first out hydration tank according to Claim 6 further
2 comprising:

3 a float movably provided adjacent said inlet tube, a lower end of the inlet
4 tube provided with valve openings through which liquid flows out of the inlet tube,
5 a float rod connecting said float to a valve sleeve, and

6 said valve sleeve movably located adjacent the valve openings as a
7 means of dynamically controlling flow of liquid out of the inlet tube through the
8 valve openings in response to variations in liquid level within the tank wall.

1 8. A first in first out hydration tank according to Claim 7 further
2 comprising:

3 a bottom of the vessel wall provided with bottom openings for draining
4 liquid from within the vessel wall, a cylinder provided on top of said tank wall, a
5 cylinder shaft attached on one end to said cylinder and attached on an opposite
6 end to a bottom drain valve seal to operably connect said cylinder and said
7 bottom drain valve seal, and

8 said bottom drain valve seal reversibly sealing with said bottom openings
9 as a means of alternately preventing and permitting liquid flow through said
10 bottom openings.

1 9. A first in first out hydration tank according to Claim 6 further
2 comprising:

3 a rotary motor provided exteriorly at a bottom of the outside tank wall, and
4 a drive shaft attached to said rotary motor and to a bottom of the vessel wall as a
5 means of rotating said vessel wall.

1 10. A first in first out hydration tank according to Claim 9 further
2 comprising:

3 a bearing and a seal provided in the bottom of the outside tank wall, and
4 said drive shaft extending through said bearing and said seal.

1 11. A first in first out hydration tank according to Claim 6 further
2 comprising:

3 an air vent provided in the top of the outside tank wall, said air vent
4 provided with a movable ball float that floats on a liquid level in the tank and
5 closes the air vent when it moves upward and reopens the air vent when it
6 moves downward.

1 12. A method of insuring first in first out flow of hydrating gel as it flows
2 through a hydration tank comprising:

3 mixing hydrating gel as it flows through a first in first out hydration tank in
4 a direction that is normal to the flow of the gel through the hydration tank.

1 13. A method according to Claim 12 wherein mixing of the hydrating gel
2 is accomplished by rotating a vessel located inside the hydration tank relative to
3 the hydration tank in a direction that is normal to the flow of the gel.

1 14. A method according to Claim 13 wherein mixing of the hydrating gel
2 is further accomplished by vanes that attach to and rotate with the vessel and
3 that extend into a flow path of the gel as the gel passes through the tank.